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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,864	01/15/2004	Yasuo Kitaoka	10873.1391US01	5959
7590	05/02/2006			
Hamre, Schumann, Mueller, & Larson, P.C. P.O. BOX 2902-0902 Minneapolis, MN 55402			EXAMINER SONG, MATTHEW J	
			ART UNIT 1722	PAPER NUMBER

DATE MAILED: 05/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/757,864

Applicant(s)

KITAOKA ET AL.

Examiner

Matthew J. Song

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 6-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 18 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/22/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I claims 1-5 and 18-19 in the reply filed on 4/7/2006 is acknowledged. The traversal is on the ground(s) that claims in Group II correspond to claims in Group I. This is not found persuasive because a serious burden exists in the differing issues likely to arise during the prosecution of the different statutory classes of invention.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 6-17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 4/7/2006.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

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the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-5 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueta et al (US 6,252,255) in view of Flynn et al (US 6,447,604).

In a method of forming a nitride semiconductor, note entire reference, Ueta et al teaches a sapphire substrate having a substrate orientation inclined by about 0.05-0.2° from a <0001> orientation and allowing a nitride semiconductor crystal to grow on the surface of the sapphire surface. Ueta et al also teaches forming a device which includes a first cladding layer of a nitride semiconductor having a first conductivity, a second cladding layer and a active layer of a nitride semiconductor interposed between the first and second cladding layers. The interface between the active layer and the first and second cladding layers are inclined by about 0.05-0.2° from a <0001> orientation (col 2, ln 40 to col 3, ln 25), this reads on applicant's surface of a semiconductor layer is a plane that is sloped in one direction and includes steps of (0001) planes arranged step wise to from an angle of at least 0.05° therebetween. Ueta et al also teaches achieving a uniform distribution of steps and improved quality of a nitride semiconductor deposited on an inclined substrate (col 3, ln 45-65). Ueta et al teaches deposition of InGaN, GaN, AlGaN (col 8, ln 40 to col 9, ln 10), this reads on applicant's semiconductor layer and Group III nitride crystal.

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Ueta et al teaches forming doped semiconductor layers on inclined substrates. Ueta et al does not teach variations in in-plane carrier concentrations are within a range of one fifth to five times a carrier concentration mean value.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Ueta et al by forming the Group III nitride crystal with a variations in in-plane carrier concentrations are within a range of one fifth to five times a carrier concentration mean value to minimize variations in the electrical properties of the crystals. The ability to form a layer with the claimed variations would be within the skill of a person of ordinary skill in the art at the time of the invention because the inclined substrate allows for improved crystalline quality, film stoichiometry, and incorporation of intentional impurity incorporation, as evidenced by Flynn et al (US 6,447,604) column 12, line 60 to column 13, line 20. Furthermore, applicant teaches using an offcut substrate allowed for limits on variations in in-plane carrier concentration, (specification pg 13, ln 10-25); therefore the use of an offcut substrate allows for the limited variation in impurity concentration.

Referring to claim 2, claim 2 merely further limits claim 1, which is a product claim, by reciting a process limitation. The patentability determination of a product-by-process claim is based on the patentability of the product and does not depend on its method of production. (MPEP 2113).

Referring to claims 3-4, Ueta et al teaches a range of 0.05-0.2°. Overlapping ranges are held to be obvious (MPEP 2144.05).

Referring to claim 5, Ueta et al teaches GaN.

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Referring to claim 18-19, Ueta et al teaches forming a light emitting diode (col 3, ln 10-25).

Conclusion

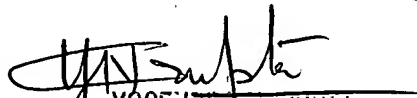
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Song whose telephone number is 571-272-1468. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Matthew J Song
Examiner
Art Unit 1722

MJS
April 28, 2006


YOGENDRA N. GUPTA
SUPERVISORY PATENT EXAMINER
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